

WHAT IS CLAIMED IS:

1. A martensitic stainless steel comprising:

in mass % C: 0.15 – 0.22%, Si: 0.18 – 1.0%, Mn: 0.05 – 1.0%, Cr: 10.5 – 14.0% and Fe as substantial residual, and further including Ni: not more than 0.20%, Al: not more than 0.05%, N: not more than 0.100%, S: 0.015% and P: 0.020% as impurities;

wherein a scale layer on the surface of the base material consists of an inner layer scale including mainly FeCr_2O_4 , and

an outer layer scale having a thickness of not more than 20 μm deposited on the surface of the inner layer scale at a surface coverage of not less than 1% and not more than 15%; and

wherein rust preventive oil is applied to the surface of said scale layer.

2. A method for manufacturing a martensitic stainless steel, comprising the steps of:

heating a base material comprising in mass % C: 0.15 – 0.22%, Si: 0.18 – 1.0%, Mn: 0.05 – 1.0%, Cr: 10.5 – 14.0% and Fe as substantial residual, and further including Ni: not more than 0.20%, Al: not more than 0.05%, N: not more than 0.100%, S: 0.015% and P: 0.020% as impurities in a quenching furnace at 850 – 980°C;

completely descaling a scale layer formed on the surface of the base material;

quenching the base material;

tempering the base material in a tempering furnace;

partially descaling a scale layer newly formed on the surface of the base material to form a finished scale layer consisting of an inner layer scale including mainly FeCr_2O_4 and an outer layer scale having a thickness of not more than 20 μm deposited on the surface of the inner layer scale at a surface coverage of not less than 1% and not more than 15%; and

applying rust preventive oil.

3. A method for manufacturing a martensitic stainless steel according to Claim 2, wherein the descaling after heating in the quenching furnace is carried out at a collision pressure of not less than 473 N/mm^2 using a high-pressure water descaler.
4. A method for manufacturing a martensitic stainless steel according to Claim 2, wherein the descaling after the tempering is carried out at a collision pressure of $167 - 343 \text{ N/mm}^2$ using a high-pressure water descaler.
5. A method for manufacturing a martensitic stainless steel according to Claim 2, wherein the descaling after heating in the quenching furnace is carried out at a collision pressure of not less than 473 N/mm^2 using a high-pressure water descaler, and wherein the descaling after the tempering is carried out at a collision pressure of $167 - 343 \text{ N/mm}^2$ using a high-pressure water descaler.